

We claim:

1. A method for creating a peer group database, said method comprising:
  - collecting security transaction data for a preselected period of time, for a plurality of investment institutions, said transaction data including identity of securities being traded, transaction order sizes, execution prices and execution times;
  - grouping said transaction data into a plurality of orders;
  - calculating a plurality of cost benchmarks for each of said plurality of orders;
  - estimating transaction costs for each investment institution relative to said cost benchmarks; and
  - storing said data.
2. The method as recited in claim 1, wherein said estimating step includes a step of regressing said transaction costs onto a plurality of percentiles.
3. The method as recited in claim 2, wherein said regressing step utilizes the formula:
$$X_i = \alpha_i + \beta_i f(S) + \gamma_i g(M) + \varepsilon_i,$$
for percentiles  $i = 25, 40, 50, 60$  or  $75$ , and each percentile  $i$  is assumed to depend linearly on functions  $f$  and  $g$  of size ( $S$ ) and momentum ( $M$ ) respectively, and  $(\alpha_i, \beta_i, \gamma_i)$  are regression parameters.
4. The method as recited in claim 3, wherein the regression parameters  $(\alpha_i, \beta_i, \gamma_i)$  are estimated using (a) ordinary least squares (OLS), (b) weighted least squares

(WLS) with respect to OLS residuals (WLS1), and (c) WLS with respect to observations in each subdivision (WLS2).

5. The method as recited in claim 3, wherein functions  $f$  and  $g$  are set to be linear functions.

6. The method as recited in claim 1, wherein said plurality of cost benchmarks include:

a closing price  $C_{T-1}$  of the security on a day prior to the day of the execution of the corresponding order;

a volume-weighted average price VWAP across all trades for the security during the day of execution of the corresponding order;

a closing price  $C_{T+1}$  of the security on the first day after the day of execution of the corresponding order;

a closing price  $C_{T+20}$  of the security on the 20th day after the day of execution of the corresponding order;

an open price  $O_T$  of the security on the day of execution of the corresponding order; and

a prevailing midquote  $M_T$  of the security prior to the execution time of the corresponding order; and

wherein each of said plurality of benchmarks are calculated for each security for each order.

7. The method recited in claim 1, wherein said estimating step takes into consideration a number of cost factors per order.

8. The method recited in claim 6, wherein said estimating step takes into consideration a number of cost factors per order.

9. The method as recited in claim 8, wherein said regressing step utilizes the formula:

$$X_i = \alpha_i + \beta_i f(S) + \gamma_i g(M) + \varepsilon_i,$$

for percentiles  $i = 25, 40, 50, 60$  or  $75$ , and each percentile  $i$  is assumed to depend linearly on functions  $f$  and  $g$  of size ( $S$ ) and momentum ( $M$ ) respectively, and  $(\alpha_i, \beta_i, \gamma_i)$  are regression parameters; and

wherein transaction costs are regressed for each cost factors.

10. The method as recited in claim 9, wherein the regression parameters  $(\alpha_i, \beta_i, \gamma_i)$  are estimated using (a) ordinary least squares (OLS), (b) weighted least squares (WLS) with respect to OLS residuals (WLS1), and (c) WLS with respect to observations in each subdivision (WLS2).

11. The method as recited in claim 9, wherein functions  $f$  and  $g$  are set to be linear functions.

12. The method as recited in claim 1, wherein said cost benchmarks are calculated in real-time as transactions are executed, and are stored in a database.

13. The method as recited in claim 1, wherein said estimating step is performed periodically for all transactions that occurred during a predetermined time frame.

14. A method for ranking a first institutional investor's security transaction cost performance relative to transaction costs of other institutional investors, said method comprising steps of:

collecting security transaction data for a preselected period of time, for a plurality of investment institutions, said transaction data including identity of securities being traded, transaction order sizes, execution prices, momentum and execution times;

grouping said transaction data into a plurality of orders;

calculating a plurality of cost benchmarks for each of said plurality of orders;

estimating transaction costs for each investment institution relative to said cost benchmarks; and

ranking said first institutional investor against said plurality of investment institutions for at least one of a number of factors.

15. The method as recited in claim 14, wherein said estimating step includes a step of regressing said transaction costs onto a plurality of percentiles.

16. The method as recited in claim 15, wherein said regressing step utilizes the formula:

$$X_i = \alpha_i + \beta_i f(S) + \gamma_i g(M) + \varepsilon_i,$$

for percentiles  $i = 25, 40, 50, 60$  or  $75$ , and each percentile  $i$  is assumed to depend linearly on functions  $f$  and  $g$  of size ( $S$ ) and momentum ( $M$ ) respectively, and  $(\alpha_i, \beta_i, \gamma_i)$  are regression parameters.

17. The method as recited in claim 16, wherein the regression parameters ( $\alpha_i$ ,  $\beta_i$ ,  $\gamma_i$ ) are estimated using (a) ordinary least squares (OLS), (b) weighted least squares (WLS) with respect to OLS residuals (WLS1), and (c) WLS with respect to observations in each subdivision (WLS2).

18. The method as recited in claim 16, wherein functions  $f$  and  $g$  are set to be linear functions.

19. The method as recited in claim 14, wherein said plurality of cost benchmarks include:

- a closing price  $C_{T-1}$  of the security on a day prior to the day of the execution of the corresponding order;

- a volume-weighted average price VWAP across all trades for the security during the day of execution of the corresponding order;

- a closing price  $C_{T+1}$  of the security on the first day after the day of execution of the corresponding order;

- a closing price  $C_{T+20}$  of the security on the 20th day after the day of execution of the corresponding order;

- an open price  $O_T$  of the security on the day of execution of the corresponding order; and

- a prevailing midquote  $M_T$  of the security prior to the execution time of the corresponding order; and

wherein each of said plurality of benchmarks are calculated for each security for each order.

20. The method recited in claim 14, wherein said factors include size and momentum.

21. The method recited in claim 19, wherein said factors include size and momentum.

22. The method as recited in claim 21, wherein said regressing step utilizes the formula:

$$X_i = \alpha_i + \beta_i f(S) + \gamma_i g(M) + \varepsilon_i,$$

for percentiles  $i = 25, 40, 50, 60$  or  $75$ , and each percentile  $i$  is assumed to depend linearly on functions  $f$  and  $g$  of size ( $S$ ) and momentum ( $M$ ) respectively, and  $(\alpha_i, \beta_i, \gamma_i)$  are regression parameters; and

wherein transaction costs are regressed for each cost factors.

23. The method as recited in claim 22, wherein the regression parameters  $(\alpha_i, \beta_i, \gamma_i)$  are estimated using (a) ordinary least squares (OLS), (b) weighted least squares (WLS) with respect to OLS residuals (WLS1), and (c) WLS with respect to observations in each subdivision (WLS2).

24. The method as recited in claim 23, wherein functions  $f$  and  $g$  are set to be linear functions.

25. The method as recited in claim 14, wherein said cost benchmarks are calculated in real-time as transactions are executed, and are stored in a database.

26. The method as recited in claim 14, wherein said estimating step is performed periodically for all transactions that occurred during a predetermined time frame.

27. A system for ranking a first institutional investor's security transaction cost performance relative to transaction costs of other institutional investors, said system comprising:

processing means for collecting security transaction data for a preselected period of time, for a plurality of investment institutions, said transaction data including identity of securities being traded, transaction order sizes, execution prices, momentum and execution times, grouping said transaction data into a plurality of orders; calculating a plurality of cost benchmarks for each of said plurality of orders; estimating transaction costs for each investment institution relative to said cost benchmarks; and ranking said first institutional investor against said plurality of investment institutions for at least one of a number of factors; and

storing means for receiving data from said processing means, storing said data, and making data available to said processing means.

28. The system according to claim 27, wherein said processing means estimates the transaction costs by regressing said transaction costs onto a plurality of percentiles.

29. The system according to claim 28, wherein said processing means performs the regression by the formula:

$$X_i = \alpha_i + \beta_i f(S) + \gamma_i g(M) + \varepsilon_i,$$

for percentiles  $i = 25, 40, 50, 60$  or  $75$ , and each percentile  $i$  is assumed to depend linearly on functions  $f$  and  $g$  of size (S) and momentum (M) respectively, and  $(\alpha_i, \beta_i, \gamma_i)$  are regression parameters.

30. The system according to claim 29, wherein the regression parameters  $(\alpha_i, \beta_i, \gamma_i)$  are estimated using (a) ordinary least squares (OLS), (b) weighted least squares (WLS) with respect to OLS residuals (WLS1), and (c) WLS with respect to observations in each subdivision (WLS2).

31. The system according to claim 29, wherein functions  $f$  and  $g$  are set to be linear functions.

32. The system according to claim 27, wherein said plurality of cost benchmarks include:

a closing price  $C_{T-1}$  of the security on a day prior to the day of the execution of the corresponding order;

a volume-weighted average price VWAP across all trades for the security during the day of execution of the corresponding order;

a closing price  $C_{T+1}$  of the security on the first day after the day of execution of the corresponding order;

a closing price  $C_{T+20}$  of the security on the 20th day after the day of execution of the corresponding order;

an open price  $O_T$  of the security on the day of execution of the corresponding order; and



a prevailing midquote  $M_T$  of the security prior to the execution time of the corresponding order; and

wherein each of said plurality of benchmarks are calculated for each security for each order.

33. The system according to claim 27, wherein said factors include size and momentum.

34. The system according to claim 32, wherein said factors include size and momentum.

35. The system according to claim 34, wherein said processing means performs the regression by the formula:

$$X_i = \alpha_i + \beta_i f(S) + \gamma_i g(M) + \varepsilon_i,$$

for percentiles  $i = 25, 40, 50, 60$  or  $75$ , and each percentile  $i$  is assumed to depend linearly on functions  $f$  and  $g$  of size ( $S$ ) and momentum ( $M$ ) respectively, and  $(\alpha_i, \beta_i, \gamma_i)$  are regression parameters; and

wherein transaction costs are regressed for each cost factors.

36. The system according to claim 34, wherein the regression parameters  $(\alpha_i, \beta_i, \gamma_i)$  are estimated using (a) ordinary least squares (OLS), (b) weighted least squares (WLS) with respect to OLS residuals (WLS1), and (c) WLS with respect to observations in each subdivision (WLS2).

37. The system according to claim 36, wherein functions  $f$  and  $g$  are set to be linear functions.

38. The system according to claim 27, wherein said cost benchmarks are calculated in real-time as transactions are executed, and are stored in a database.

39. The system according to claim 27, wherein said processing means performs periodically for all transactions that occurred during a predetermined time frame.

40. A system for ranking a first institutional investor's security transaction cost performance relative to transaction costs of other institutional investors, said system comprising:

a processing unit coupled with a network and configured to collect security transaction data for a pre-selected period of time, for a plurality of investment institutions, said transaction data including identity of securities being traded, transaction order sizes, execution prices, momentum and execution times, to group said transaction data into a plurality of orders, to calculate a plurality of cost benchmarks for each of said plurality of orders, to estimate transaction costs for each order relative to said cost benchmarks, and to store said data in a database; and

a database unit coupled with said processing unit and configured to communicate with said processing unit, store data and making data available to said processing unit.

41. The system according to claim 40, wherein said processing unit is further configured to estimate the transaction costs by regressing said transaction costs onto a plurality of percentiles.

42. The system according to claim 41, wherein said processing unit is further configured to perform the regression by the formula:

$$X_i = \alpha_i + \beta_i f(S) + \gamma_i g(M) + \varepsilon_i,$$

for percentiles  $i = 25, 40, 50, 60$  or  $75$ , and each percentile  $i$  is assumed to depend linearly on functions  $f$  and  $g$  of size ( $S$ ) and momentum ( $M$ ) respectively, and  $(\alpha_i, \beta_i, \gamma_i)$  are regression parameters.

43. The system according to claim 42, wherein the regression parameters  $(\alpha_i, \beta_i, \gamma_i)$  are estimated using (a) ordinary least squares (OLS), (b) weighted least squares (WLS) with respect to OLS residuals (WLS1), and (c) WLS with respect to observations in each subdivision (WLS2).

44. The system according to claim 43, wherein functions  $f$  and  $g$  are set to be linear functions.

45. The system according to claim 44, wherein said plurality of cost benchmarks include:

a closing price  $C_{T-1}$  of the security on a day prior to the day of the execution of the corresponding order;

a volume-weighted average price VWAP across all trades for the security during the day of execution of the corresponding order;

a closing price  $C_{T+1}$  of the security on the first day after the day of execution of the corresponding order;

a closing price  $C_{T+20}$  of the security on the 20th day after the day of execution of the corresponding order;

an open price  $O_T$  of the security on the day of execution of the corresponding order; and

a prevailing midquote  $M_T$  of the security prior to the execution time of the corresponding order; and

wherein each of said plurality of benchmarks are calculated for each security for each order.

46. The system according to claim 45, wherein said factors include size and momentum.

47. The system according to claim 45, wherein said cost benchmarks are calculated in real-time as transactions are executed, and are stored in a database.

48. The system according to claim 45, wherein said processing unit performs estimates periodically for all transactions that occurred during a predetermined time frame.

49. The system according to claim 40, further comprising at least one client interface coupled with said database unit, said client interface configured to display a ranking for a selected institution based on said data stored in said database unit.

50. The system according to claim 49, wherein said client interface is configured to graphically display said ranking as bar graphs, said ranking shown as a percentage of a total range for a plurality of factors.

51. The system according to claim 49, wherein said client interface is configured to graphically display said ranking as bar graphs, said ranking shown as a percentage of a total range for each said cost benchmark.